Can Germany Be Starved Into Submission?

BY

Dr. HUGO SCHWEITZER

Post President, Chemists Club of New York City; late Secretary, New York Section, Society of Chemical Industry of Great Britain; ex-Chairman Verein Deutscher Chemiker, New York City; Member American Chemical Society

An Address Delivered before the German University League, New York, N. Y., February 3, 1915.

Can Germany Be Starved Into Submission?

BY

Dr. HUGO SCHWEITZER

PUBLISHED BY
The German American Literary Defense Committee
150 Nassau Street
New York

Can Germany Be Starved Into Submission?

By Dr. Hugo Schweitzer.

In the titanic struggle which "Perfide Albion"—that implacable enemy of all nations which threaten to rival or surpass her in trade and industry—has forced upon Germany it is difficult to determine what is most worthy of our admiration.

Is it the matchless bravery and endurance of the German soldiers and sailors, or the admirable leadership and resourcefulness of the officers of the army and navy who have conducted their gallant forces from victory to victory, so that today all of Belgium and the most important territory of France, as well as the industrial section of Russia, are in the hands of the Teutonic allies?

Is it the magnificent unity of this great and wonderful country, where all differences in creeds and politics, all distinctions between rich and poor have vanished and where now there are only Germans to defend home and family against six hostile nations?

Is it the patriotic love and enthusiastic devotion of the German women, who without tears in their eyes but with a smile on their faces, see their dearest ones depart for the cruel ordeal to risk health and life in the sodden trenches?

Or is it the wise forethought and the infinite care with which the Civil Government of Germany is scientifically meeting the problem of supplying food to the people during war times?

As was to be expected, the subsidized Anglo-American press has failed to exhibit intelligence enough to realize that precautionary measures in this direction are not alarming signs of impending famine and threatened destruction of the people, but that while the war lasts, the food supply and the cultivation of the soil must be so adjusted as to assure the proper and economic feeding of the whole people.

It is my aim tonight to demonstrate to you the masterly manner in which the German Government proceeds to achieve this purpose.

As in so many other commercial and industrial pursuits, Germany is the foremost nation in agriculture, the oldest of all human endeavors. The essential objects of agriculture are the cultivation of the soil for the production of *carbohydrates* for human consumption, and of *fodder for animals,* the meat of which furnishes the albumen and fats in our diet.

The successful tillage of the soil requires *proper fertilization.* The beneficial effect of barn yard manure upon crops was well established thousands of years ago in many countries of the earth. The aborigines of New England before the arrival of the whites even knew the use of "artificial fertilizers" since it is stated in the records of the Plymouth Colony that Squantum, a friendly Indian, showed the colonists how to manure their corn by putting a fish in each hill.

It was not, however, until the advent of Liebig, the great German chemist, about three-quarters of a century ago, that rationalism took the place of empiricism in the agricultural industry. It seems marvelous and almost incredible to the uninitiated that, after the pursuit of agriculture for thousands of years and the firmly rooted belief that the accumulated experience of ages left nothing of practical value to be learned in this branch, a chemist, who had never been a farmer, had never held a plough, never tilled the ground, should, from his desk, teach the agriculturist how to treat the soil in order to impart to it constant productivity. Yet it is only through Liebig's teachings of the treatment of the soil and of the natural laws governing the cultivation of the ground that a truly rational system of agriculture has been evolved.

Not only did Liebig enunciate new views upon agriculture, but he also devised processes for the production of *artificial manures,* and when chemical science took possession of this field of industry most things were ready, and there only remained to be carried out what the mind of the great master had devised and foreseen. To replace the nourishing constituents which Liebig had shown, by most painstaking research, the plants took from the soil, namely, potash, phosphoric acid and nitrogenous substances, a huge industry had to be called into existence. Artificial fertilizers were made from the nitre fields of Chile, from the enormous deposits of potash salts in

Germany, from the rich deposits of phosphates of our own South, of the Pacific Guano Islands and of Algiers and Tunis.

It is evident that to provide for a bountiful harvest for *next year* it became incumbent upon the Government to secure sufficient *laborers* to till the soil and to arrange for the *required quantities of fertilizers.*

In spite of the fact that mobilization made especially heavy drains on the rural population, enough farm hands were secured for the necessary work in the fall, and on account of the very favorable autumn weather, the cultivation of the soil went on as usual, the condition of *winter cereals* being reported as most excellent.

The self-sacrifice of the general public, which at once recognized the vital importance of carrying on work in the fields during the war, was truly astonishing. At the outbreak of hostilities, half grown boys and girls volunteered their services, organizations were formed to bring men and women who were out of employment to the farms, where they were set to work under the guidance of voluntary overseers.

The fifteen year old daughter of a friend of mine residing in Gross-Lichterfelde, near Berlin, during our visit last August, left her home at four in the morning to work with forty other girls in the fields, and helped to garner the crop under the supervision of a man who, with his threshing machine, went from farm to farm, giving his services gratuitously. She returned at nine in the evening without ever complaining of weariness and always with a smiling countenance.

The ladies employing servant girls coming from farms gave them permission to return home to help along. During this furlough the ladies did their own work.

Actors and actresses whose occupation was more seriously affected by the war than any other profession toiled in the fields, enjoying this enforced vacation. At present the skilled farm hands among the prisoners of war are being employed in cultivating the soil, and it is fair to presume that in spring the work will go on as usual. All labor will be especially facilitated since electric stations throughout the Empire now supply cheap power for the farmer, which is very welcome while draft animals are doing service in the war.

In regard to the procuring of artificial fertilizers, we need not entertain any fear as far as the *potash* requirements are concerned. Germany is in fact the only country

from which agriculture, as well as the other industries of the world, are able to draw this all important material. By shutting off France, England and Russia from these supplies, the interests of the enemy will be very materially injured.

Great among the benefactors of mankind is the German chemist, A. Frank, who in 1861 suggested and began the commerical exploitation of the hitherto useless potash-salts and thus created Germany's world monoply! From mining 2,300 tons in 1861, the production grew to 12 million tons in 1913! Of this immense quantity 90% is employed in agriculture; Germany alone utilizes 50%, while the United States takes 20%, the balance being distributed among all other countries of Europe.

The most important *nitrogenous* fertilizers are saltpeter, ammonia salts and the chemical calciumcyanamide, known commerically as limenitrogen. Saltpeter is imported from Chile and as it is the main raw material for the manufacture of nitric acid, which is absolutely essential in the production of gunpowder and explosives of all kinds, it has always been recognized as contraband of war. In 1913 Germany imported about 800,000 tons of nitre, of which about 600,000 tons were used for fertilizing purposes and about 200,000 tons for the manufacture of explosives and other chemicals. As all the available stock of saltpeter has been requisitioned by the Government, agriculture must look for other sources of nitrogenous fertilizers.

Aside from the fact that German soil has been so well cultivated for the last 50 years that the lack of sufficient nitrogen fertilizer in one season could not possibly affect its productivity, the country has at its disposal several tried methods of securing substitutes for saltpeter. Inasmuch as the Chile nitre beds are calculated to last no longer than about twenty years, German chemists have ever been on the lookout for that emergency. At first they provided the chemical "sulfate of ammonia" which was obtained from the nitrogenous constituents of coal recovered among the byproducts in the coking process. Of the 500,000 tons of this material manufactured in 1913, as much as 10% was available for export in times of peace. But while the war lasts the iron and associated coke-industry will not be fully occupied and hence a shortage of sulfate of ammonia might be expected. To make up any deficiency, the synthesis of ammonia from nitrogen and hydrogen by Professor Haber is available,

which in its infancy already furnished 40,000 tons, and which is now carried out on a very large scale.

Sulfate of ammonia and saltpeter possess substantially the same efficiency as nitrogenous fertilizers. The other chemical "calciumcyanamide," which does not occur in nature but was first made artificially by the German chemists, Frank and Caro, is being employed for the same purpose after elaborate tests in experimental agriculture had demonstrated its value. Today 70,000 tons of this material are used as fertilizer and this production could also be easily increased. Both products, the Haber ammonia and the Frank-Caro calciumcyanamide, are the outcome of processes of utilization of the nitrogen from the air. These methods are especially advantageous for German conditions, as they consume comparatively *little electric power* and require only such raw materials as occur in great abundance in Germany. On the other hand, the process of utilizing nitrogen from the air by the combination of nitrogen and oxygen under the formation of nitric acid through the medium of the electric arc and the silent electric discharge, or under the influence of electrical tension demand *much electric energy* and can therefore be executed only in countries rich in cheap water power such as Norway.

The Haber and Frank-Caro processes moreover have the great advantage that they easily furnish *nitric acid by oxidation of ammonia,* and in these very days with the aid of the German Government, factories will be started where the manufacture of nitric acid from ammonia will be economically carried out, thus furnishing a new source for the supply of this substance which is so badly needed in the chemical industries and in the manufacture of explosives. If Germany in this manner makes herself independent of the importation of saltpeter she will retain almost 50 million dollars which she yearly expends abroad.

Of extreme importance for agriculture are the *phosphoric acid* fertilizers of which the super-phosphates are particularly well known. Germany is obliged to import a large quantity of phosphatic raw material and in 1913 bought from us alone 3 million dollars worth of phosphate rock.

Here again the fact that the phosphates, especially the super-phosphates, are the oldest of artificial fertilizers and have been so largely used that the German soil is thoroughly saturated with them, will prove of material benefit. In all probability there will not be any decrease

in yields, if for one season phosphatic fertilizers were dispensed with altogether. But such an extreme measure will not likely be necessary. There are numerous places in the valley of the Rhine and of the Lahn rivers where phosphate-containing rocks abound. These are not as rich as our Florida phosphate, but may be relied upon to replace a goodly quantity of the imported material. To supplement the output of phosphate fertilizer, Germany can utilize the slag obtained in the production of Thomas steel, called Thomas slag, which is already a well known fertilizer and will necessarily enjoy still greater popularity. But of much greater importance as a source of phosphate fertilizers are the provinces of Liege and Hennegau, especially the district around Mons where very valuable deposits of phosphatic rock occur. In 1910 almost 400,000 tons of this material were mined and in 1913, 60,000 tons were imported into Germany. During the war the entire production could be transported there, and if the crude methods prevailing at the mines were improved by German engineering and chemical skill and the quantity mined thus increased, then Germany could make up any deficiency caused by the absence of shipments from the United States, the Guano Islands and Africa.

For the chemicals needed to rationally fertilize the soil, German agriculture *paid in* 1910 *the sum of* 100 *million dollars*. What astounding results have been obtained!

The average annual yield of wheat of 20 bushels (60 lbs.) per acre in the five year period of 1883/1887 has increased for the five year period of 1908/1912 to 31 bushels. For rye the corresponding increase is from 16 to 28½ bushels (56 lbs.); for summer barley from 24 to 37½ bushels (48 lbs.); for oats from 31½ to 53 bushels (32 lbs.) and for potatoes from 130 to 199 bushels (60 lbs.).

How far ahead Germany is over all other nations appears from the following comparison, the more so since it must be borne in mind that German soil is rather poor and has been drawn upon to feed her people for nearly two thousand years.

In 1912 Germany raised per acre 33½ bushels of *wheat* against 16 in the United States, 10 in Russia and 20 in Canada and France.

Of *rye* the yields were 30 in Germany, 17 in the United States, 14 in Russia, 22 in France and 19 in Canada.

Germany raised 40½ bushels of *barley* against 30 in the the United States, 16 in Russia, 26 in France and 30 in Canada.

Of *oats* the yields are 54 in Germany, 37½ in the United States, 23½ in Russia, 35 in France and 42 in Canada, and for *potatoes* the figures are 222½ in Germany, 113 in the United States, 121 in Russia, 110 in France and 171½ in Canada.

Still more remarkable are the figures for the sugar-beet crop. In the season of 1888/89 the German factories worked up about 8 million tons of beets into 1 million tons of sugar, requiring 7.97 lbs. of beets for 1 lb. of sugar. In 1910/11 about 16 million tons of beets were used and furnished over 2½ millions tons of sugar, or exactly 6.08 lbs. of beets for 1 lb. of sugar. In the year 1912/13 Germany produced the incredible quantity of almost 3 million tons of sugar!

The significance of these figures is simply colossal; they demonstrate that German ingenuity during the last twenty-five years has doubled the domain of the Empire and draws from its soil crops which other countries do not raise from twice and triple the acreage.

For many of the figures here given, I am indebted to the publication by Helfferich, entitled "Germany's National Wealth," issued on the occasion of the Emperor's 25th Anniversary of his reign.

Germany's enemies in discussing the reasons for this greatest of all wars pretend that the books by Treitschke, Nietzsche and Bernhardi precipitated the conflagration. If this war was really caused by a book it is in my opinion due to *Helfferich's triumphant chant of German prosperity* which must have filled the mind of the English statesmen with envy and malice and must have contributed more than any other agency in convincing England that now is the time to smash Germany.

Enormous as has been the progress in the cultivation of the soil, the animal industry of the country has made equally great advances.

This has resulted in a wonderful improvement of the breeds of farm animals, especially of cattle, with a material improvement in the quality and quantity of meat and milk.

In 1883 the census showed 3½ million horses, in 1912 over 4½ million; the cattle in 1883 numbered almost 16 million, in 1912 over 20 million; of pigs there were 9 million in 1883, and 22 million in 1912. Only the num-

ber of sheep decreased from 20 million in 1883 to 6 million in 1912 for the reason that pasture land is very scanty in Germany, all the arable soil being utilized for intensive farming.

To feed these animals, to which must be added about 4 million goats in 1912 and almost 85 million fowls, is an immense task.

In spite of the most careful utilization of the waste products of the flour mills, the sugar and starch factories, the brewing and distillery industries, Germany is unable to feed her farm animals except by importing about 250 million dollars worth of fodder consisting especially of barley, bran, maize and oilcake, and this supply is practically cut off during the war.

But Germany can easily make up any deficiency in fodder by means of potatoes, of which last year she raised 50 million tons, and sugarbeets, which it will be impossible to utilize for the manufacture of sugar to the same extent as in former years on account of the lack of export facilities. It will also become necessary to carefully husband the leaves and tops of the sugarbeets and the leaves of turnips which have been more or less wasted in the past. But above all, great attention must be paid to kitchen garbage, for if this be returned to the farm there will be an abundance of fodder and hence a satisfactory production of meat.

The value of this offal is shown by the results of an investigation, according to which the kitchen waste of Berlin alone would feed annually ¼ million of pigs, that is, 20% of all pigs slaughtered in that city in 1913.

Besides being blessed with bountiful crops of cereals, potatoes and fruit in the year of the war, the outbreak of hostilities found Germany with the largest supply of live stock that breeders have ever known, the raising of which had been encouraged by previous high market values and good harvests.

Germany has, therefore, an abundance of bread-cereals, potatoes and meat which constitute the most important articles of diet of its people. It is now incumbent upon the government to cause the population to husband its food resources in such a manner that until the next crop there shall be no want.

The first steps taken in this direction were laws providing for *duty free admission* and *prohibition of exportation* of all materials of food, cereals, cattle, meat, fodder, oils and fats, etc. Next regulations were issued concerning

the production and consumption of "the staff of life," bread. In late years, unfortunately, the German people have largely adopted the perfectly white wheat bread, which as regards nutritive properties is greatly inferior to bread made from the darker whole wheat flour or from rye flour. The reason for this is that the bran and gluten, which contain the highly nutritious albumen, have been removed on account of their dark color. Completely white wheat flour contains only 10.2% albumen. while the coarser quality contains 12.06% and rye 11.57%. As gluten and bran cannot be ground as fine as wheat or starch, the finer sieves will not allow these substances to pass through. This does not apply to the whitest constituents of flour, and therefore, the finer the sieves the larger the residue and the smaller the yield of flour, this, as already stated, being also less nutritious owing to the absence of the coarser gluten and bran.

Bearing this in mind, the German government on October 28, 1914 issued rules to the miller to increase the yield of flour so that 100 lbs. of wheat would furnish at least 75 lbs. of flour, and 100 lbs. of rye at least 72 lbs. of flour. This regulation alone very materially increases the supply of flour from the available wheat and rye. As rye and wheat possess practically the same nutritive value, the only difference being that the white color of the latter is more pleasing to the eye, the availability of these two cereals as food may be considered together.

Last year the consumption of wheat per head was 90.6 kilo, of rye 147.9, and of both 238.5 kilo. For wheat a deficiency of 26.6 kilo must be registered to be made good by importation, while rye showed an excess of 17 kilo which was exported. Accordingly, there is a net lack of 9.6 kilo which, considering the total consumption of wheat and rye of 238.5, is entirely negligible. Yet the German government is doing everything in its power to make up even so slight a deficiency. It forbids the exportation of rye and rye flour and the use of wheat and rye for fodder. To make the supply of wheat which furnishes the whitest flour last longer, it rules that at least 10% of rye flour and at least 5% of potato meal, which quantity may be increased to 20%, must be added. The use of 5% of potato meal is amply sufficient to make up the lack of 9.6 kilo per head of the 238.5 total consumption.

Elaborate investigations have shown that bread made of flour mixed as above is just as palatable as bread made

of the finest wheat flour and much more nutritious. This, which is called "K" bread, is now generally consumed, and there is no doubt that it will retain its popularity even after peace has been declared. In whiteness it differs very little from pure wheat bread as potato meal itself is even whiter than wheat flour.

Great stress is laid on combating the prejudice against potatoes as a general food. This material, of which an almost *limitless supply* is on hand, is a most digestible and valuable article of diet. Physiological experiments have again and again demonstrated the fact that even an exclusive diet of potatoes and fat enables men to engage in hard work and retain perfect health without loss of weight.

Modern improvements, such as the preservation of potatoes in the form of dried chips, protect them against deterioration and decomposition and make the year's crop available for a long time thereafter. This new drying industry has been particularly fostered by the government which recognized the immense importance of preserving, and thus keeping from decay, the most abundant food supply of Germany. Potato chips are not only fit for use as a fodder, but also for human consumption.

After having thus efficiently provided for the breadstuff supply of the country, the government fixed maximum prices on all cereals in the most scientific manner, keeping in mind the conditions of transportation by rail and water, the places of production, the local markets of rural or urban communities. In this way speculation with these necessities of life is avoided; and by varying the maximum prices, the use of cereals for the purposes for which they are best adapted, is assured.

Of great interest is the clever way in which the government is enforcing the use of barley as fodder for which it is more suitable than the forbidden rye and wheat. For the various provinces the maximum price of barley is 15 to 20 Marks per ton *lower* than that of rye. Consequently, it is profitable for the farmer to sell rye at the higher price and to purchase the cheaper barley for his stock, rye being thus made available for human consumption.

To further increase the use of rye as a food the government restricted the quantity to be employed in the fermentation industry to 60% of the normal amount. This reduction carried with it a very appreciable decrease of the quantity of barley used in the distilleries, where, in the form of malt, it is of extreme importance. Though

this cereal is equally necessary in the brewing industries, the fact that the majority of the beer consumers are at the front will lead to a smaller consumption of malt beverages and therefore of barley.

The barley thus saved will be highly welcome as fodder, and it is estimated that at least 10% of the total quantity of material used as food for animals, which is ordinarily imported, will be thus replaced.

In England by artificial manipulation and speculation the price of a 4 lb. loaf of bread rose from 5 d. (10c.) at the beginning of the war to 7½ d. (15c.) on January 9, 1915, while today German bread, which is just as nutritious and palatable, can be purchased at the same or even a lower price than that at which it was sold before the war.

As the London Times of January 9, 1915, says:

> "In the deliberate opinion of grain dealers the price of bread in this country has not since the war been raised in proportion to the rise in wheat and flour. That, strange as it may seem at first, is attributed to the fact that the London baking trade was, at any rate on the outbreak of war, largely in the hands of Germans. The German bakers were not disposed to advance their prices quickly, lest their action might be misunderstood."

Another German atrocity!

In starving Belgium on January 5th, one loaf of bread weighing one kilo sold at 40 Centimes, that is, about 8 cents. The same quantity of rye bread costs in New York 12.4 cents and wheat bread 14 cents.

The General Federation of Trades Unions in the United Kingdom, recognizing the forethought shown by the German government in husbanding the food resources of the empire, issued a document in which it demands that the British government should *commandeer the whole home grown and unmarketed wheat supply* at a certain maximum price. The document states that immediate action on these lines would tend to moderate prices.

Frightened by the rise of wheat prices and of flour the chairman of the Clean Food Club, of Chicago, announced that white bread is a habit. Women should declare an embargo against it and use rye, corn, potato and brown bread instead—exactly the same measures which Germany devised for the welfare of her people—yet the subsidized Anglo-American press has failed to

inform us that *famine and starvation* are reigning in Great Britain and the United States.

During all this time an organization—the German War Grain Company—formed by prominent bankers and capitalists, acquired all bread cereals offered in the open market, with the idea to store it until next summer. Then when supposedly the scarcity would be greatest the accumulated foodstuff was to be sold at prices netting the shareholders 5% profit. But these purchases and those for prompt consumption became smaller and smaller, because the holders of grain were not satisfied with the profits to be made at the prevailing maximum prices. They hoped that the latter would be raised in the near future. This policy threatened a complete withdrawal of cereals from the market so that the bakers and the people at large might not be able to buy for their actual needs.

There the government stepped in again, and on February 1st, the supply of bread cereals was taken over by the authorities to be sold at strictly regulated prices in appropriate quantities.

Concerning the meat supply, which is so plentiful, the government has so far issued no regulations. As stated before, Germany had the greatest supply of live stock in her history at the start of the war. Undoubtedly a larger number of animals than under ordinary conditions have been slaughtered during the last five months owing to the fear of a rise in the price of fodder. Consequently, prices of meat are at present kept low, but the fear may be justified that its *present abundance* has depleted the number of animals, and this may create a *shortage of meat in the future*. Nothing of the kind, however, is likely to happen. The Germans are today the heaviest meat eaters in Europe, even surpassing the English, the figures being 52.3 kilo in Germany to 47.6 kilo in England, while Italy consumes only 10.4. If need be, the per capita consumption in Germany might be easily reduced without any injury to health, especially if we bear in mind that in 1900 the per capita consumption was only 43.4 kilo and in 1879 only 29.5 kilo. Yet the population in 1879 was in every respect as healthy and well fed as that in 1914!

Regarding the German supply of edible fats, it is to be noted that there has been a great waste of fats and oils in the kitchens of Germany, and altogether the consumption of fat is excessively large.

Economies can be easily practiced and thus a good deal of the edible oils imported from the United States (to the value of 23 million dollars in the year 1913) may be saved. It must also be remembered that butter is now as freely imported as heretofore from Denmark and Sweden, from which large supplies of especially fattened pigs are also obtainable.

Again, a modern development in the fat and oil industry has provided Germany with means to utilize materials which hitherto were unfit for eating.

By the so-called method of hardening fats and oils—that is, by treating them with hydrogen—they are not only converted from the *cheap liquid* into the *higher priced solid* form, but their taste and odor are so improved that they might serve for culinary purposes, while without being subjected to the hardening process, they could not possibly be thus employed. Even the various grades of fish oils can thus be rendered available as food materials. Germany cannot possibly be cut off from the supply of these oils. The fisheries of the Baltic and the North Sea, of Norway and Sweden would place an inexhaustible and cheap source of fats and oils at the disposal of the German people.

By this hardening process even the waste fats (foots) obtained in refining can be utilized not only for soap making, but also for foodstuffs. In short, by suitable treatment with hydrogen, all oleaginous matter may be converted into edible substances.

Regarding the milk, butter and cheese supply, we may add that Germany, according to Rubner, has at present about 11 million milch cows producing 1150 ccm. of milk per capita each day, while the average consumption is only 341 ccm., in addition to 18 grams of cheese and 7.8 grams of butter.

It is, therefore, obvious that Germany has a superfluity in this class of foods. If the consumption of butter be reduced by 1 gram per person, the saving would amount to about 25,000 tons of butter per year, equal to about 750,000 tons of milk. In view of the fact that each milch cow produces annually 2,500 liters of milk, or approximately 2½ tons, 300,000 animals could be killed for food purposes without interfering seriously with the milk supply.

In addition to this abundance of bread, potatoes, meat and dairy supplies, it is to be noted that Germany possesses in sugar a most welcome article of food. Of the

production of 1913/14, a considerable quantity has been retained in the country, and in the season of 1914/15 a supply of 2½ million tons became available for the people. Of what tremendous value this mass of food will be, appears from the fact that the per capita consumption of sugar in England in 1913 was 40 kilo, while in Germany it was only 21 kilo. This large sugar supply, together with the bountiful crop of fruit which Germany enjoyed last year, permitted the manufacture of immense quantities of jams and marmelades, the food value of which will be enormous. This will be especially appreciated in view of the possibility of a scarcity of edible fats, since 2 lbs. of sugar are equivalent in food caloric value to 1 lb. of butter—the highest priced fatty food. The immense stores of sugar will also permit its use as fodder by mixing six parts of oats with one part of sugar, and you can imagine how pleasing this *war feed* will be to the horses. This stretching of the oats supply will make the latter cereal available for human consumption as oatmeal, grits, etc.

It might also be mentioned that Germany has an abundant supply of salt which plays such an important part in nutrition.

Then again we must consider that even in a country so highly developed as Germany there are still resources locked up and materials wasted which, if properly utilized, may add to the nation's food supply.

There are a number of plants—at present for the most part undesirable weeds, but formerly used as vegetables and salads—which might today again serve for culinary purposes. To these plants belong the various species of dandelions and of urticaria, which are still in use today, especially in Russia, where the young plant is esteemed as a vegetable and the matured is utilized as fodder for cattle. Besides there are the different species of sorrel furnishing salads very popular in France; the sage, plantains, and cress, all of which find uses in the kitchens of some countries.

The yeast of the fermentation industries, of which Austria-Hungary alone produces about 30 thousand tons, has been allowed to run to waste, although it represents a nutrient of highest value, its albumen content being equivalent in calories to meat albumen.

It may be employed as an addition to soups, sauces and stews and is altogether an excellent dietetic food for underfed and convalescent people. Except its use

at present by the German military administration for soup-conserves and as a strengthening addition to the soldier's bread, this valuable material produced in such immense quantities is totally discarded.

During the war the breweries of Austria-Hungary have decided to furnish their yeast gratis to the population.

In the sulphite paper process there are obtained annually 600,000 tons of waste liquors that now vitiate the water of the rivers into which they are conducted, kill fish and spread bad odors, making the adjoining districts uninhabitable. These liquors, however, contain sugar which is formed from the intercellular substance of the wood. Recent investigations, especially those by König, the famous German food chemist, seem to indicate that the utilization of this waste as a material of food is near at hand.

We thus see that there is hardly any chance of starving Germany into submission and into a dishonorable peace, provided the people exercise ordinary care in attending to their wants. The government has surely done its duty; what is left must be done by communities and individuals. It is wonderful to note how all classes rose to contribute to this end.

The municipal authorities are providing *empty lots* and *useless garden plots* for the raising of peas, beans and lentils. Strange to say, *peas and lentils*, which have constituted such an important element in the diet have entirely disappeared from the German markets, as they were mostly imported from Russia. The same authorities have arranged that parts of the icehouses connected with the breweries be reserved for the storing of fresh meat and of smoked and pickled provisions. In this way the live stock killed during the winter owing to the unwarranted fear of lack of fodder will be preserved for the spring and summer. Arrangements have also been made to purchase supplies of seafood during the winter and to preserve them for the summer months by salting and drying and storing them in municipal warehouses.

The physicians of Germany have initiated a campaign for spreading modern ideas on nutrition among the people. What will be emphasized is that meat, milk and eggs are not the only strengthening foods; that on the contrary an exclusive diet of this kind is injurious. Vegetable food is absolutely necessary, especially in

public institutions like hospitals, prisons, barracks, etc. Children are to be taught to eat salads, fruits, potatoes and vegetables.

Furthermore, the public is being warned against the excessive consumption of alcoholic beverages, especially while the war lasts, so that the raw materials employed in the fermentation industries may be used as food.

To promote moderation in the use of alcoholic drinks it is urged that restaurants and hotels should be closed at early hours and opened late.

In England *temperance* measures have likewise been adopted because drunkenness in that country had increased enormously since the start of hostilities. First of all an extra war tax on beer was imposed. Lloyd George anticipated, of course, that the consumption of beer would diminish, but he did not expect that the decrease would be nearly *double his estimate.* Worse still, the consumers of malt beverages were *driven to whiskey drinking,* and the new tax had the totally unexpected result of increasing the sale of spirits, which is most marked in towns and cities.

Public houses in England are also opened later in the day and closed earlier, mainly for the purpose of preventing as far as possible the soldiers' wives from investing their separation allowances in whiskey.

When it was found that this restriction of the drinking hours had no other effect than to make the wife of Tommy Atkins imbibe faster and get drunk quicker, the authorities issued orders whereby sodier's wives in receipt of separation allowances were required to conform with certain standards of propriety and sobriety.

And here you have a great example of the difference between English and German culture and civilization. While the German soldier's wife takes care of her children and household, and in the hard times of war perhaps manages to do some additional work, thereby earning an extra penny, the *law* must step in to prevent the wife of the English soldier from wasting her allowance by getting drunk and thus neglecting home and family.

Who has ever seen a drunken German woman? On the other hand, who will ever forget the spectacle of drunken women lying in the gutters of the streets of London, Liverpool, Manchester, etc., and of seeing

viragos fighting with each other with their dresses half off their bodies.

That is English culture and civilization!!

The public itself is being instructed in many ways, and housewives especially are requested to practice precautionary measures. The following circular published by a number of professors of political economy and physiology, among them Wagner, Schmoller, Rubner, Zuntz, contains advice which, on account of its fundamental importance, may well interest those countries which are not involved in the war:

1. Treat all nutritious material respectfully and economically and use carefully every utilizable refuse.

2. Eat the army bread (K bread) and demand it from your baker. It is nourishing and as palatable as plain rye or wheat bread. Potatoes are plentiful but the bread cereals will suffice only if from 10 to 20% of potatoes are baked in the loaves or if less bread and more potatoes are eaten.

3. Reserve the wheat bread, such as rolls, etc., for patients and invalids and restrict particularly the use of cake, butter cakes and other pastry to the lowest limits, for we are short one-third of the previously necessary supply of wheat and wheat flour.

4. Be sparing in the use of meat, fat and butter. To be sure, we have now an abundant supply of cattle for slaughter because many farmers no longer have the fodder formerly imported. But that is no reason that one should now consume more meat. If this happens, the supply will soon become very scanty. The use of meat, fat and butter should be restricted now so that our people will suffer no lack at a later time. Whoever can, should lay in a stock of preserved provisions (smoked ham and bacon and dried sausages) and lard for his home use, but should do so deliberately and without precipitate hurry.

5. The bulk of the food must be formed by our indigenous vegetable material, potatoes, rye, wheat, oats, buckwheat, vegetables, fresh and preserved fruit. Sugar can be used freely. Sugar, which is on hand in almost excessive quantities, is an excellent nutriment and a substitute for fat and butter. In addition, one should use milk and cheese, particularly skimmed milk and skimmed milk cheese, which are an excellent substitute for meat on account of their protein contents.

Verily in these times of high cost of living such rules might even be profitably observed by our population which is obliged to pay for the necessities of life more dearly than the nations at war.

What can be *grander* in all civilization than this wonderful evolution of German agriculture which under the government's fostering care is now providing the necessities of life for 70 *million people in a country smaller than the State of Texas?* The development of this most important branch of all human pursuits is primarily due to the sciences, botany, medicine and especially chemistry. The original researches made by the members of these professions—however abstruse and theoretical they may have been—were quickly utilized by the practical agriculturists, among whom none have been quicker to learn than the *"Junkers,"* the *"East Elbians,"* against whom the hatred of Germany's enemies is especially directed; and well it may be, for these "Junkers" by their hard work as tillers of the soil have mainly solved the problem of feeding the nation when cut off from all foreign supplies.

But the greatest credit for the achievements of German agriculture is due to Emperor William II, the wonderful man who in his farsightedness recognized before all others the absolute necessity of raising food for the nation within its own domain, who reconciled the interests of agriculture with the everclashing interests of industry, and who in spite of the heavy duties of government resting upon his shoulders, found time to deliver public lectures on the original investigations carried out under his guidance regarding the cultivation of the most extensive German peat or turf-beds, the object of which was to increase the tillable acreage of Germany, thereby augmenting the food supply of the people and lowering the cost of living.

410 Riverside Drive
New York, N. Y.